DOCUMENT RESUME

ED 436 570 TM 030 432

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TITLE A Validity Study Comparing the ACT and the HOBET Entrance Examinations for Health-Care Students.
PUB DATE 1999-11-00
NOTE 14p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Point Clear, AL, November 17-19, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; *College Entrance Examinations; College Students; Correlation; Grade Point Average; Health Occupations; Higher Education; *Prediction; *Validity
IDENTIFIERS *ACT Assessment

ABSTRACT

This study examined the relationship between results of the ACT Assessment and the Health Occupations Basic Entrance Test (HOBET) entrance examinations. The purpose of the study was to estimate the validity of the HOBET as a predictor of student success and to compare the two examinations as predictors of grade point average (GPA) for students in the health care field. The sample consisted of 320 students from a small, private, health-care oriented college in the mid-south. The college offers bachelor's degrees in nursing and in health sciences. The data were compiled from fall 1995 through fall 1998. The variables examined included ACT scores, HOBET scores, total credit hours, and GPA. All students were given the HOBET only after scoring 20 on the ACT. The two examinations were correlated for this sample, and both were correlated with GPA. The HOBET was a better predictor of GPA than the ACT. The correlation coefficient was smaller than that found in a previous study (Educational Resources, 1993), probably because of the homogeneity of the sample. (Contains 5 tables and 10 references.) (SLD)

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A Validity Study Comparing the ACT and the HOBET Entrance Examinations for Health-Care Students

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Paper presented at the Annual Meeting of Mid-South Educational Research Association, Point Clear, Alabama, November 17, 1999

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Abstract

The study examines the relationship between the ACT and the HOBET (Health Occupations Basic Entrance Test) entrance examinations. The purpose of the study was to: (a) estimate the validity of the HOBET as a predictor of student success and (b) compare the two examinations as predictors of GPA for students in the health-care field. Nearly 60 percent of college freshman take the ACT (Reisberg, 1998). New proposed guidelines on admissions criteria by the Education Department's Office for Civil Rights take a firm stance against admissions criteria that rely on entrance examinations as the primary tool for admissions decisions (Healy, 1999). Therefore colleges need to take a close look at the role of entrance examinations in making admissions decisions.

The sample consisted of 320 students from a small, private, health-care oriented college located in the mid-south. The college offers bachelors degrees in Nursing (BSN) and in Health Sciences (BHS). The majors of the students included Nursing, Radiology, and Respiratory Care. The data was compiled from the fall 1995 semester to the fall 1998 semester. The variables examined included ACT scores, HOBET scores, total credit hours, and GPA. All students were given the HOBET only after making a 20 on the ACT.

The results were that the two examinations were correlated in this sample. Both examinations were also correlated to GPA. The HOBET examination was found to be a better predictor of GPA than the ACT. Although the two examinations were correlated the correlation coefficient was smaller than ones found in a previous study (Educational Resources, 1993). This was probably caused by the homogeneity of the sample.

A Validity Study Comparing the ACT and the HOBET Entrance Examinations for Health-Care Students

Barry Schultz and Ernest A. Rakow

Background

The Education Department's Office for Civil Rights has recently taken a firm stance against admissions criteria that rely primarily on test scores. Since minorities have lower average scores on tests like the ACT, schools that rely on these tests will have to prove that their admission polices do not violate federal anti-bias laws (Healy, 1999). Even though courts have generally deferred to the judgement of the colleges when dealing with such decisions, the use of standardized tests is becoming increasingly challenged (Cantrell, 1999). Thus colleges and universities need to insure that their admission criteria, especially entrance examinations being used, are both reliable and valid.

Standardized testing has had a significant effect on the admission process and entrance examinations. Standardized admission examinations were developed to improve high school education and to standardize the chaotic admission requirements to colleges of the time. The first such examination, called the Regents examination, was developed in 1878. The founding of the College Entrance Examination Board (which developed it's own standardized admission examination) lead to many colleges abandoning their own admission tests in the early 1900's (Hossler, 1988). Today, the two most popular undergraduate entrance examinations are the ACT and the SAT.

Entrance examinations gave admission counselors an easy way to compare students (Hossler, 1988). Even though admission examinations were designed to be only supplements to high school grades and class rank, examinations such the ACT and the

SAT tend to be weighted heavier than grades (Sturgeon, 1994). Even thought there are vast difference in the quality of secondary schools, it has been shown that high school grades are a better predictors of college success than entrance examinations (Sturgeon, 1994; Thornell & Jones, 1986).

Purpose

The purpose of this paper is to examine the validity of an entrance examination that has been developed for health care students called the HOBET (Health Occupations Basic Entrance Test) for students at a small, private, health-care oriented college located in the mid-south. The HOBET examination developed in 1989 is composed of two subtests: essential mathematics skills and reading comprehension. Information on test taking skills, stress level, social interaction, reading rate, and learning styles are also provided to the student (Educational Resources, 1993).

To show the validity of the HOBET examination, performance on it was compared to the ACT scores and college GPA. Nationally, about 995,000 students took the ACT in 1998 which represents nearly 60 percent of college freshman (Reisberg, 1998). It has long been known that a linear relationship between scores on the ACT examination and success in school (Gordon, 1976; Sawyer & Maxey, 1979). Correlation coefficients for the relationships between college performance and ACT/SAT scores have been calculated by numerous studies and have ranged between .07 and .5 (Mouw & Khanna, 1993). Correlation coefficients greater than .80 have been found between ACT-English scores and HOBET-reading comprehension scores. Also correlation coefficients

greater than .80 were found between the ACT-Mathematics scores and HOBET-essential mathematics skill scores (Educational Resources, 1993).

The HOBET examination has also been shown to have internal consistency. Split-half reliability coefficients have been found between .81 and .98 for both the reading comprehension subtest and the essential mathematics skill subtest. To ensure content validity a panel of faculty from health care related areas were selected from different regions of the United States to develop the questions for the HOBET examination. Criterion-related validity was established by comparing the composite score of the HOBET to the composite score of the ACT. The correlation coefficients of this comparison ranged between .79 and .83 (Educational Resources, 1993).

Methodology

For this study, the sample consisted of 320 students from a small, private, health-care oriented college located in the mid-south. The college offers bachelors degrees in Nursing (BSN) and in the Health Sciences (BHS). The majors of the students included Nursing, Radiology, and Respiratory Care. Approximately 74% of the baccalaureate students major in nursing while 26% major in one of allied health majors. 87% percent of the students are female and 13% are males. The college ethnic makeup is 79% Caucasian, 20% African American, and 1% other. The college is located in an urban medical center and is part of a large hospital system.

The data was compiled from the fall 1995 semester to the fall 1998 semester. The sample included all students enrolled at the college during this period who took both the HOBET examination and the ACT examination as part of their admission requirements

and completed at least one semester of classes. The variables examined included ACT scores, HOBET scores, total credit hours, and GPA. All students at the college were given the HOBET only after making a 20 on the ACT. The students had to score a minimum of 43 on the HOBET examination to be accepted into the school. Thus, there is a two step selection process based on test scores, first at least a 20 on the ACT and secondly at least a 43 on the HOBET as well as acceptable high school GPA.

The HOBET examination score is a composite of a mathematics score and a reading comprehension score. The mathematics subtest evaluates the student's ability in the following areas: whole numbers, decimal operations, percents operations, number system conversions, and algebraic equations. The reading comprehension subtest evaluates the student's ability to read science-related material. Passages are graded on a 10^{th} grade level (Educational Resources, 1993).

To examine the validity of the HOBET, the composite score was compared to the composite ACT score. Also the HOBET composite score and the ACT score were compared to current college cumulative GPA. The cumulative GPA in the last semester the student was enrolled was used a measure of student success. Comparisons between the two tests were also made on freshman (credit hours < 34) and on students in their clinical courses (credit hours > 65).

Results

ACT composite scores ranged between 20 and 34 with a mean of 22.3 and a standard deviation of 2.44 while the HOBET ranged between 43 and 89 with a mean of

65.9 and a standard deviation of 9.4 (See Table 1). The cumulative GPA ranged between 0.50 and 4.00 (See Table 1).

Pearson correlation coefficients were calculated to examine the relationships between the ACT composite score, the HOBET score, and cumulative grade point average (See Table 2). All three correlation coefficients were found to be significant at the .01 level. The largest relationship found was between the ACT and the HOBET examinations (r = .50). The HOBET examination (r = .45) had a stronger relationship with cumulative GPA than the ACT examination (r = .34).

When the subjects were limited to only first year students, i.e. those who had taken less than 34 credit hours at this college, the correlation coefficients of the relationships between ACT scores, HOBET scores, and cumulative GPA were all still significant (See Table 3). In this table the highest correlation is .51 for HOBET with cumulative GPA, which is higher than for the total sample (r=.45). The correlation between the ACT and the HOBET was slightly reduced for this sub-sample (r = .50 to r = .46). For this sub-sample the lowest correlation was also between ACT and GPA (r = .35)

When the subjects were limited to only upper class students, those who had taken more than 69 credit hours at this college, i.e. the correlation coefficients of the relationship between ACT scores and the HOBET scores; and the relationship between the HOBET and cumulative GPA were all still significant at the .01 level (See Table 4). As in the total sample, the highest correlation is between ACT and HOBET (r = .57). Also HOBET correlation more with GPA (r = .37) that ACT with GPA (.27). The

relationship between the ACT scores and the cumulative GPA was also significant but only at the .05 level.

When examining separate regression equations predicting college GPA from the ACT composite scores(See Table 5) or the HOBET scores (See Table 6) the betas (.365 for HOBET and .159 for ACT) are both significant at the .01 level. The HOBET explains nearly 20% of the variance in GPA while ACT explains about 12% of the variance in GPA. When ACT composite is added to the model after the HOBET the R squared is increased by only .019 (.198 to .217). When the HOBET is added to the model after the ACT composite the R squared is increased by .099 (.118 to .217).

Conclusions

The correlation matrix for the entire sample shows that the HOBET is better predictor of student success than the ACT composite for this sample. The HOBET and the ACT composite are correlated which supports that the HOBET is also a measure of academic success for students in Health-Care majors. The correlation between those two examinations in this study was smaller than correlations found in previous studies. This was probably caused by the homogeneity of the sample.

When only students with less than 34 credit hours are considered, it can be seen that the HOBET actually improves as a predictor while the ACT is approximately the same for these students as the entire sample. For students with more than 69 credit hours, which should be representative of students who have reached the clinical component of their education, the HOBET is still a better of academic success that the ACT composite. The ACT seems to lose some of its predictive ability for these students.

When the regression equations are considered, it is easy to see that both examinations are predictors of student success at this particular college. Also, when the HOBET is added to the ACT it explains about 10 % more variance that the ACT alone. Although the R Square (about 2%) change is significant when the ACT is added to the HOBET, it does not seem to be substantive and is probably an effect of sample size. Thus the HOBET is a valid predictor of student academic success for students in a heath-care related major. It predicts success slightly better than the ACT composite for these students and does explain some additional variance beyond what is explained by the ACT composite. Possibly the HOBET could be used as alternative for the ACT for these students since the ACT explains very little variance above what the HOBET does. However, before this change can be recommended, examination of the relationship between ACT and HOBET should be done on another sample which includes lower scores on both examinations. Other variables that should be studied are the effects that ~~age,~~ ethnicity, major, or age have on the HOBET's ability to predict student achievement.

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Table 1

Descriptive Statistics for Sample of 320 Students

	Min	Max	M	SD
ACT Composite	20	34	22.33	2.44
HOBET	43	89	65.94	9.43
Cumulative GPA	0.50	4.00	2.85	0.80
Credit hours	3	134	44.87	30.01

Table 2

Correlation Matrix

	1	2	3
	Students (n = 320)		
1. ACT Composite	--	.503 **	.343 **
2. HOBET		--	.445 **
3. Cumulative GPA			--

Note. ** $p < .01$.

Table 3

Correlation Matrix for First Year Students Only (Credit < 34)

	1	2	3
	Students (n = 139)		
1. ACT Composite	--	.457 **	.345 **
2. HOBET		--	.511 **
3. Cumulative GPA			--

Note. ** p < .01.

Table 4

Correlation Matrix for Upper Class Students (Credit Hours > 69)

	1	2	3
	Students (n = 85)		
1. ACT Composite	--	.570 **	.267 *
2. HOBET		--	.367 **
3. Cumulative GPA			--

Note. *p < .05 **p < .01.

Table 5

Summary of Regression Equations Predicting College GPA Beginning with ACT Examination (N = 320)

Variables	B	SE B	β
Step 1			
ACT Composite	.113	.017	.343**
Step 2			
ACT Composite	.05244	.019	.159**
HOBET	.03112	.005	.365**

Note. R^2 = .118 for step 1; ΔR^2 = .099 for step 2 (ps < .01). **p < .01.

Table 6

Summary of Regression Equations Predicting College GPA Beginning with HOBET Examination (N = 320)

Variables	B	SE B	β
Step 1			
HOBET	.03796	.004	.445**
Step 2			
HOBET	.03112	.005	.365**
ACT Composite	.05244	.019	.159**

Note. R^2 = .198 for step 1; ΔR^2 = .019 for step 2 (ps < .01). **p < .01.